REMARKS

Applicants appreciate the Office's review of the present application. In response to the Office Action, the cited references have been reviewed, and the rejections and objections made to the claims by the Examiner have been considered. The claims presently on file in the present application are believed to be patentably distinguishable over the cited references, and therefore allowance of these claims is earnestly solicited.

In order to render the claims more clear and definite, and to emphasize the patentable novelty thereof, claims 1, 6-7, 13, 21, 26, 31-32, 34, and 42 have been amended, and new claims 43-45 have been added. Support for any new claims is found in the specification, claims, and drawings as originally filed, and no new matter has been added. Accordingly, all claims presently on file in the subject application are in condition for immediate allowance, and such action is respectfully requested.

Rejections

Rejection Under 35USC Section 103

Claims 1-3, 13, 22, 26-29, 34, 39, and 41 have been rejected under 35 USC Section 103(a), as being unpatentable over U.S. patent 6,456,387 to Pardo et al. ("Pardo") in view of U.S. patent 6,317,217 to Toda ("Toda"). Applicants respectfully traverse the rejection and request reconsideration based on the amendment to claims 1, 13, 26, and 34 and features in the claims which are neither disclosed nor suggested in the cited references, taken either alone or in combination.

As to a rejection under 103(a), the U.S. Patent and Trademark Office ("USPTO") has the burden under section 103 to establish a *prima facie* case of obviousness by showing some objective teaching in the prior art or generally available knowledge of one of ordinary skill in the art that would lead that individual to the claimed invention. *See In re Fine, 837 F.2d 1071, 5*

U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). The Manual of Patent Examining Procedure (MPEP) section 2143 discusses the requirements of a *prima facie* case for obviousness. That section provides as follows:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must be found in the prior art, and not based on applicant's disclosure.

Independent claim 1 (amended), and its dependent claims 2-3 and 39, are patentably distinguishable over the cited references because claim 1 emphasizes the novel features of the present invention which ascertain consumable resource requirements of a print job based on the resource requirements of a single portion of the formatted document smaller than the entire document, prior to sending the print job to a printer. In this regard, claim 1 recites:

"1. (Currently amended) A method for ascertaining resource requirements of a print job via a printer driver, the method including:
    creating a document of the print job with the print driver and reading the print job into memory directly from the print driver;
    formatting the document in the memory into a print format consistent with a layout of the document on print media, the formatted document having a document area;
    overlaying a sample window over <u>a single portion</u> of the formatted document in the memory, the window having a window area smaller than the document area;
    analyzing the single portion to determine <u>consumable</u> resource requirements of the portion; and
    <u>ascertaining the resource requirements of the print job based on the resource requirements of the single portion prior to sending the print job to a printer</u>." (emphasis added)

The Pardo reference discloses a "<u>printing apparatus</u> which predicts resource usage for a printing operation, [and] determines whether resources available in the printing apparatus are sufficient for the predicted usage" (Abstract; emphasis added). The "controller 11 <u>accepts image</u>

data that is <u>derived by an unshown host computer through communication port 12</u> and processes the image data" (col. 4, lines 43-46; emphasis added). The printing apparatus bands the image (S604, Figs 6(a)-6(b)), and then <u>predicts resource usage (CPU, memory, and bandwidth) for each band</u> (S605, Figs 6(a)-6(b); emphasis added). The Pardo reference further explains that "predictors are provided that predict (a) CPU power required to render the DART representation, and (b) memory required to store the DART representation. If printer 10 were equipped with external memory linked to CPU 41 via a bandwidth-limited communication line, then a third predictor would be provided as to the bandwidth requirements for each DART representation" (col. 7, lines 13-19).

The Toda reference discloses "a printing system ... which can minimize the mapping time of characters at a host computer and the transfer data amount from the host computer by mapping the received character code of each character as a character image" (col. 1, lines 47-52). The Toda reference does not disclose ascertaining the resource requirements of a print job. Accordingly, the Toda reference has been cited by the Office only with regard to the creating step, and not with regard to any of the other steps recited in claim 1.

The features of the present invention are neither disclosed nor suggested by the Pardo reference in combination with the Toda reference in that ascertaining the resource requirements of the print job is performed <u>after</u> sending the print job to the printer, <u>not before</u> sending the print job to the printer as recited in claim 1. Resource usage prediction is performed by the <u>printing apparatus</u> of the Pardo reference, <u>after</u> it has received the image data from the host computer via port 12. Conversely, claim 1 recites that the resource requirements are ascertained <u>prior</u> to sending the print job to the printer. "On receipt of the print job, the driver 306 performs a job length assurance analysis. ... Job length assurance involves: 1) monitoring of printer resources (e.g. toner); 2) analyzing print jobs to estimate the resource requirements for same; and 3) either printing the job or providing an indication of insufficient resources" (specification, p.5, lines 12-17; Fig. 3). Then, "the print job is then passed to the printer (not shown) via the print driver 306" (specification, p.5, lines 6-7).

In addition, the features of the present invention are neither disclosed nor suggested by the Pardo reference in combination with the Toda reference in that the resource requirements of the print job are ascertained based on the resource requirements of <u>all</u> the bands of the Pardo reference, not on only a <u>single</u> portion as recited in claim 1. As stated by the Office with regard to the Pardo reference, "the resource determination is based on <u>all</u> of the portions" (Office Action, p.4; emphasis added). However, as recited in Applicants' claim 1, a sample window is overlaid over a single portion of the formatted document, the single portion is analyzed to determine the consumable resource requirements of the portion, and the resource requirements of the entire print job are ascertained based on the resource requirements of <u>only the single portion</u> of the document.

Also, the features of the present invention are neither disclosed nor suggested by the Pardo reference in combination with the Toda reference in that the resource requirements ascertained by the Pardo reference are not those of <u>consumable</u> resources, as recited in claim 1. According to the Pardo reference, "[t]he resources described here, namely CPU power, memory and bandwidth, are <u>representative of the types of resources</u> that printer 10 may be provided with" (col. 7, lines 20-22). A characteristic represented by these resources is that they <u>do not</u> require physical replacement after they have been fully utilized during a printing operation. Once the operation has been completed and processing stops, CPU power, memory, and bandwidth are fully available for the next operation. Conversely, however, consumable resources as recited in claim 1 are used up or exhausted in a manner that <u>does</u> requires physical replacement or replenishment. Once a consumable resource such as toner or ink has been used up, printing operations cannot continue until their replacement or replenishment occurs. Therefore, CPU power, memory, and bandwidth, as disclosed in the Pardo reference, are <u>not representative</u> of consumable resources (such as toner or ink) as recited in claim 1. Accordingly, consumable resources as recited in claim 1 are not taught or suggested by the CPU power, memory, or bandwidth resources of the cited references.

Applicants respectfully traverse the Office's assertion that it would have been obvious to

a person of ordinary skill in the art at the time the invention was made to include the claimed features of Applicants' invention. Such could be possible only in hindsight and in light of Applicants' teachings. Therefore, the rejection is improper at least for that reason and should be withdrawn.

Independent claim 13, 26, and 34 (all currently amended) each recites at least some limitations similar to those of claim 1, discussed above.

Claim 13 recites:

"13. (Currently amended) A method for ascertaining resource requirements of a print job via a print driver, the method including:
    creating a document of the print job with the print driver and reading the print job into memory directly from the print driver;
    overlaying a sample window over a single portion of the document;
    performing a low resolution level analysis of <u>only the single portion</u> of the formatted document overlaid by the sample window to determine <u>consumable</u> resource requirements of the overlaid portion;
    <u>extrapolating the resource requirements of the single overlaid portion to estimate consumable resource requirements of the entire print job</u>; and
    comparing the estimated resource requirements of the print job to data relating to an availability of the resource and providing an output with response thereto prior to sending the print job to a printer." (emphasis added)

Claim 26 recites:

"26. (Currently amended) A program stored on a computer readable medium for ascertaining resource requirements of a print job received by a print driver including:
    code for creating a document of the print job with the print driver and reading the print job into memory directly from the print driver;
    code for formatting the document in the memory into a print format consistent with a layout of the document on print media, the formatted document having a document area;
    code for overlaying a sample window over a <u>single portion</u> of the formatted document in the memory, the window having a window area smaller than the document area;
    code for analyzing the single portion to determine <u>consumable</u> resource requirements of the portion; and
    <u>code for ascertaining the resource requirements of the print job based on the resource requirements of the single portion prior to sending the print job to a printer</u>." (emphasis added)

Claim 34 recites:

"34. (Currently amended) A program stored on a computer readable medium for ascertaining resource requirements of a print job received by a print driver including:

code for creating a document of the print job with the print driver and reading the print job into memory directly from the print driver;

code for overlaying a sample window over a single portion of the document;

code for performing a low resolution level analysis of <u>only the single portion</u> of the formatted document overlaid by the sample window to determine <u>consumable</u> resource requirements of the overlaid portion;

<u>code for extrapolating the resource requirements of the single overlaid portion to estimate consumable resource requirements of the entire print job;</u> and

code for comparing the estimated resource requirements of the print job to data relating to an availability of the resource and providing an output with response thereto prior to sending the print job to a printer." (emphasis added)

In rejecting claim 26, the Office presents the same rationale as used for claim 1. In rejecting claims 13 and 34, the Office presents the same rationale as used for claim 1 except for the limitation of the analysis being a low level resolution analysis. Therefore, Applicants believe that the features of the present invention are not taught or suggested by the cited references for the same reasons as presented above with regard to claim 1

Applicants respectfully traverse the Office's assertion that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the claimed features of Applicants' invention. Such could be possible only in hindsight and in light of Applicants' teachings. Therefore, the rejection of independent claim 13 and its dependent claim 22; independent claim 26 and its dependent claims 27-29 and 41; and independent claim 34 is improper at least for that reason and should be withdrawn.

Claims 6, 21, 31, 40, and 42 have been rejected under 35 USC Section 103 (a), as being unpatentable over U.S. patent 6,456,387 to Pardo et al. ("Pardo") in view of U.S. patent 6,317,217 to Toda ("Toda"), and further in view of U.S. published patent application 2002/0060801 to Motamed et al. ("Motamed "). Applicants respectfully traverse the rejection and request reconsideration based on the dependence of these claims on one of independent

claims 1, 13, 26, and 34, whose reasons for allowability over the Pardo and Toda references have been discussed heretofore and against which the Motamed reference has not been cited.

Dependent claims 6, 21, 31, 40, and 42 are further patentably distinguishable over the cited references because there is no reasonable expectation of success in combining the Pardo and Toda references and the Motamed reference, and because there is no suggestion or motivation to modify the reference or to combine reference teachings other than that provided by impermissible hindsight and in light of Applicants' teachings. With regard to the lack of reasonable expectation of success, the non-consumable resources disclosed in the Pardo reference are not representative of consumable resources such as toner or ink. Estimating the usage of consumable resources as disclosed by the Motamed reference would be of no use in predicting usage of the kind of non-consumable resources - CPU power, memory, or bandwidth - disclosed by the Pardo reference. Nor would it be of any use in predicting the resource usage for each band in a very high speed and less cost way, because adding the processing load and memory load of additional and completely different resource estimation and prediction tasks, such as for ink and toner, would only reduce CPU speed and bandwidth, and increase memory usage, thus exacerbating the very problems that the Pardo reference is concerned above. Accordingly, not only is there no suggestion or motivation to modify the reference or to combine reference teachings other than that provided by impermissible hindsight and in light of Applicants' teachings, but the references teach away from such a combination.

Furthermore, with regard to claims 6, 21, 31, and 42, even if it were permissible to combine the references and if there were a reasonable expectation of success and if they did not teach away from the proposed combination, the combined references would still not teach or suggest all of Applicants' claim limitations. The Motamed reference discloses a multiple-processor raster image processing (RIP) system for processing print instruction files. With regard to the estimation of resource requirements, the Motamed reference teaches:

> "[0027] Thumb RIP: A very low resolution RIP that is used specifically for the creation of thumbnail images. The thumb RIP is the processing stage where low resolution images

are generated. Two methods implemented for the generation of thumbnails in the preferred embodiment of the invention. The first method uses sub-sampling techniques applied to the full resolution rendered page. In the second method, the rendered page can be generated in multiple formats, e.g. any bit depth per color plane and multiple compression techniques. The thumb RIP is much faster than a full resolution RIP process and requires less system resources than a full resolution RIP. The thumb RIP creates a small thumbnail image for viewing or for other purposes (e.g. toner estimation). It should be appreciated that a thumbnail could also be generated elsewhere in the system."

It is well-known that a thumbnail image is a reduced-size version of an entire larger image. The Motamed reference discloses two techniques for performing a RIP of the entire rendered page in order to create low-resolution thumbnail images of the entire page. Conversely, as recited in claims 6, 21, 31, and 42, a RIP is performed only on the portion of the formatted document within (or overlaid by) the sample window. This portion is less than the entire rendered page. Therefore, the Motamed reference, in combination with the Pardo and Toda references, does not teach or suggest all the limitations of claim 1. Furthermore, by teaching that the entire rendered page is to be RIP'd, the cited references teach away from performing a RIP of only a portion of the formatted document.

Applicants respectfully traverse the Office's assertion that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the claimed features of Applicants' invention. Therefore, the rejection is improper at least for these additional reasons and should be withdrawn.

Claims 7-12 and 32-33 have been rejected under 35 USC Section 103 (a), as being unpatentable over U.S. patent 6,456,387 to Pardo et al. ("Pardo") in view of U.S. patent 6,317,217 to Toda ("Toda"), further in view of U.S. published patent application 2002/0060801 to Motamed et al. ("Motamed"), and still further in view of U.S. patent 5,663,750 to Sakuma ("Sakuma"). Applicants respectfully traverse the rejection and request reconsideration based on the dependence of these claims on one of independent claims 1 and 26, whose reasons for allowability over the Pardo and Toda references have been discussed heretofore and against

which the Motamed and Sakuma references have not been cited. Applicants also respectfully traverse the rejection and request reconsideration based on the dependence of these claims on one of dependent claims 6 and 31, whose reasons for allowability over the Pardo, Toda, and Motamed references have been discussed heretofore and against which the Sakuma reference has not been cited.

Dependent claims 7 and 32 are further patentably distinguishable over the cited references because the combined references do not teach or suggest all of Applicants' claim limitations. Claim 7 recites:

"7. (Currently amended) The invention of Claim 6 wherein the document area is defined by a first plurality of dots in a row dimension and a second plurality of dots in a column dimension, wherein the window area is defined by a third plurality of dots in the row dimension and a fourth plurality of dots in the column dimension, the third plurality less than the first plurality, and the fourth plurality less than the second plurality, and wherein the step of ascertaining the resource requirements includes multiplying the window coverage by a factor related to a size of the window area to determine the page coverage of the document." (emphasis added)

The Sakuma reference discloses ink estimation; in particular, two alternative methods for estimating ink consumption. In the first method - where a bit pattern memory is available, all the text data is developed into bit pattern data, and the total number of dots for all the bit pattern data is calculated - there is no teaching or suggestion to multiply the window coverage by a factor related to a size of the smaller area to determine page coverage of the document. In the second, alternative method - which cannot be combined with the first method because it is used "for processors that have no bit pattern memories" (col. 4, lines 60-61) - the "total amount of ink to be consumed can then be determined by multiplying the average amount of ink consumed for printing one character to the total number of characters" (col. 4, lines 63-66). In other words, the sample window is character-based and has a size of one character.

Conversely, as recited in claim 7, claim 6, and base claim 1, the formatted document is not in characters but is in a print format that corresponds to the dots that are used to form the image. Furthermore, the size of the sample window is not a single dot, but rather is a plurality of

dots.

The Pardo reference predicts resource usage for <u>bands</u> (S605, Figs. 6(a)-6(b)). These bands, illustrated in Fig. 5, have the <u>same width</u> as the entire document area. In other words, considering the band as defining the window area, the Pardo reference teaches a window area that is smaller than the document area in <u>only one</u> dimension. The Toda reference, though it does not disclose resource prediction, also appears to disclose the use of such bands. The Motamed reference, as discussed heretofore, discloses that the <u>entire</u> rendered page is used for resource estimation.

Conversely, as recited in claim 7, claim 6, and base claim 1, the formatted document has a document area defined by a number of dots in a row dimension and a number of dots in a column dimension. A sample window having a sample area smaller than the document area is overlaid on a single portion of the formatted document; the window area is also defined by a plurality of dots in the row dimension and a plurality of dots in the column dimension. However, the window area is smaller in <u>both</u> the row dimension and the column dimension than is the document area.

For the above reasons, the features of the present invention as recited in claim 7 are neither disclosed nor suggested by the Pardo, Toda, Motamed, and Sakuma references in combination. The limitations of claim 32 are similar to those of claim 7, and are traversed for similar reasons. Claims 8-12 depend from claim 7, and claim 33 depends from claim 32, and thus they are allowable for the same reasons.

Applicants respectfully traverse the Office's assertion that it would have been obvious to a person of ordinary skill in the art at the time the invention was made to include the claimed features of Applicants' invention. Therefore, the rejection is improper at least for these additional reasons and should be withdrawn.

Claims 23 and 24 have been rejected under 35 USC Section 103 (a), as being unpatentable over U.S. patent 6,456,387 to Pardo et al. ("Pardo") in view of U.S. patent

6,317,217 to Toda ("Toda"), and further in view of U.S. patent 5,663,750 to Sakuma ("Sakuma"). Applicants respectfully traverse the rejection and request reconsideration based on the dependence of these claims on independent claim 13, whose reasons for allowability over the Pardo and Toda references have been discussed heretofore and against which the Sakuma reference has not been cited.

Claim 14 has been rejected under 35 USC Section 103 (a), as being unpatentable over U.S. patent 6,456,387 to Pardo et al. ("Pardo") in view of U.S. patent 6,317,217 to Toda ("Toda"), further in view of U.S. published patent application 2002/0060801 to Motamed et al. ("Motamed "), and still further in view of U.S. patent 5,337,362 to Gormish et al. ("Gormish"). Applicants respectfully traverse the rejection and request reconsideration based on the dependence of this claims on independent claim 13, whose reasons for allowability over the Pardo and Toda references have been discussed heretofore and against which the Motamed and Gormish references have not been cited.

Claims 15-20 and 35-37 have been rejected under 35 USC Section 103 (a), as being unpatentable over U.S. patent 6,456,387 to Pardo et al. ("Pardo") in view of U.S. patent 6,317,217 to Toda ("Toda"), and further in view of U.S. patent 6,517,175 to Kanaya et al. ("Kanaya"). Applicants respectfully traverse the rejection and request reconsideration based on the dependence of these claims on one of independent claims 13 and 34, whose reasons for allowability over the Pardo and Toda references have been discussed heretofore and against which the Sakuma reference has not been cited.

Formalities

Claim Objections

Claims 1, 13, 26, and 34 were objected to because "overlayed" is more correctly spelled

as "overlaid". The claims have been amended to eliminate the objectionable spelling.

Conclusion

Attorney for Applicant(s) has carefully reviewed each one of the cited references made of record and not relied upon, and believes that the claims presently on file in the subject application patentably distinguish thereover, either taken alone or in combination with one another.

Therefore, all claims presently on file in the subject application are in condition for immediate allowance, and such action is respectfully requested. If it is felt for any reason that direct communication with Applicant's attorney would serve to advance prosecution of this case to finality, the Examiner is invited to call the undersigned Robert C. Sismilich, Esq. at the below-listed telephone number.

AUTHORIZATION TO PAY AND PETITION

FOR THE ACCEPTANCE OF ANY NECESSARY FEES

If any charges or fees must be paid in connection with the foregoing communication (including but not limited to the payment of an extension fee or issue fees), or if any overpayment is to be refunded in connection with the above-identified application, any such charges or fees, or any such overpayment, may be respectively paid out of, or into, the Deposit Account No. 08-2025 of Hewlett-Packard Company. If any such payment also requires Petition or Extension Request, please construe this authorization to pay as the necessary Petition or Request which is required to accompany the payment.

Respectfully submitted,

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